

WHAT IS CLAIMED IS:

1. An ultrasonic diagnostic apparatus,
comprising:

an ultrasonic probe for transmitting ultrasound to
5 a subject having been injected with a contrast agent,
and receiving ultrasonic echo from the subject;

a driving signal generator for generating a
driving signal for driving the ultrasonic probe;

10 a control unit for performing scanning for a
plurality of times with ultrasound of such a high
intensity that the contrast agent is collapsed at a
time-varying time interval after the contrast agent is
injected, and controlling the driving signal generator
based on a scan sequence in which the time interval
15 after the scanning performed for an initial time is set
to be 5 seconds or shorter; and

a processor for plotting a time-varying
concentration graph of the contrast agent based on the
ultrasonic echo.

20 2. The ultrasonic diagnostic apparatus according
to claim 1, wherein

the measurement processor derives a mean transit time
of a blood flow based on the time-varying graph.

25 3. The ultrasonic diagnostic apparatus according
to claim 1, wherein

the control unit controls the driving signal
generator in such a manner that the initial scanning is

performed after a lapse of time in which the contrast agent is fully filled in a target part of the subject, and

5 based on a result of the initial scanning, the measurement processor standardizes a value of the scanning to be performed after the initial scanning to plot the graph.

4. An ultrasonic diagnostic apparatus, comprising:

10 an ultrasonic probe for transmitting ultrasound to a subject having been injected with a contrast agent, and receiving ultrasonic echo from the subject;

a driving signal generator for generating a driving signal for driving the ultrasonic probe;

15 a control unit for controlling the driving signal generator based on a scan sequence in which scanning is performed for a plurality of times with a constant time interval after the contrast agent is injected; and

20 a processor for plotting a time-varying concentration graph of the contrast agent based on a plurality of cumulative values or average values of the ultrasonic echo as a result of the scanning performed for the plurality of times.

5. The ultrasonic diagnostic apparatus according to claim 4, wherein

the measurement processor derives a mean transit time of a blood flow based on the time-varying graph.

6. The ultrasonic diagnostic apparatus according to claim 4, wherein

the control unit controls the driving signal generator in such a manner that the initial scanning is performed after a lapse of time in which the contrast agent is fully filled in a target part of the subject, and

10 based on a result of the initial scanning, the measurement processor standardizes a value of the scanning performed after the initial scanning to plot the graph.

7. An ultrasonic diagnostic apparatus, comprising:

15 an ultrasonic probe for transmitting ultrasound to a subject having been injected with a contrast agent, and receiving ultrasonic echo from the subject;

a driving signal generator for generating a driving signal for driving the ultrasonic probe;

20 a control unit for controlling the driving signal generator based on a predetermined scan sequence for plotting a time-varying concentration graph of the contrast agent;

25 a signal processor for applying a detection process and a logarithmic transformation process to the ultrasonic echo;

an image generator for generating an ultrasonic image based on an output of the signal processor;

an antilogarithmic transformation unit for applying an antilogarithmic transformation process to an output signal coming from at least either of the signal processor or the image generator; and

5 a processor for plotting a time-varying graph based on the output signal coming from the antilogarithmic transformation unit.

8. The ultrasonic diagnostic apparatus according to claim 7, wherein

10 the measurement processor derives a mean transit time of a blood flow based on the time-varying graph.

9. The ultrasonic diagnostic apparatus according to claim 7, wherein

15 the control unit controls the driving signal generator in such a manner that an initial scanning is performed after a lapse of time in which the contrast agent is fully filled in a target part of the subject, and

20 based on a result of the initial scanning, the measurement processor standardizes a value of the scanning performed after the initial scanning to plot the graph.

10. An ultrasonic diagnostic apparatus, comprising:

25 an ultrasonic probe for transmitting ultrasound to a subject having been injected with a contrast agent, and receiving ultrasonic echo from the subject;

a driving signal generator for generating a driving signal for driving the ultrasonic probe;

a control unit for controlling the driving signal generator based on a predetermined scan sequence for plotting a time-varying concentration graph of the contrast agent;

10 a signal generator for generating a first signal as a result of a detection process and a logarithmic transformation process applied with respect to the ultrasonic echo, and a second signal as a result of the detection process applied with respect to the ultrasonic echo;

15 an image generator for generating an ultrasonic image based on the first signal; and

15 a measurement processor for plotting the time-varying graph based on the second signal.

11. The ultrasonic diagnostic apparatus according to claim 10, wherein

20 the measurement processor derives a mean transit time of a blood flow based on the time-varying graph.

12. The ultrasonic diagnostic apparatus according to claim 10, wherein

25 based on a result of the scanning performed for an initial time after a lapse of time in which the contrast agent is fully filled in a target part of the subject, the measurement processor standardizes a value of the scanning performed after the initial scanning to

plot the graph.

13. An ultrasonic diagnostic apparatus, comprising:

an ultrasonic probe for transmitting ultrasound to
5 a subject having been injected with a contrast agent, and receiving ultrasonic echo from the subject;

a driving signal generator for generating a driving signal for driving the ultrasonic probe;

10 a control unit for controlling the driving signal generator based on a predetermined scan sequence for deriving a time-varying concentration of the contrast agent;

an image generator for generating an ultrasonic image based on the ultrasonic echo; and

15 a measurement processor for plotting a time-varying concentration graph of the contrast agent based on the ultrasonic echo, and for compensating a mean transit time of a blood flow derived from the time-varying graph depending on a measurement position
20 depth.

14. The ultrasonic diagnostic apparatus according to claim 13, wherein

the control unit controls the driving signal generator in such a manner that an initial scanning is
25 performed after a lapse of time in which the contrast agent is fully filled in a target part of the subject, and

based on a result of the initial scanning, the measurement processor standardizes a value of the scanning performed after the initial scanning to plot the graph.

5 15. An ultrasonic diagnostic apparatus, comprising:

an ultrasonic probe for transmitting ultrasound to a subject having been injected with a contrast agent, and receiving ultrasonic echo from the subject;

10 a driving signal generator for generating a driving signal for driving the ultrasonic probe;

a control unit for controlling the driving signal generator based on a predetermined scan sequence for plotting a time-varying concentration graph of the contrast agent;

15 an image generator for generating an ultrasonic image based on the ultrasonic echo; and

a measurement processor for plotting the time-varying concentration graph of the contrast agent based on the ultrasonic echo, and for compensating the time-varying graph depending on a measurement position depth.

20 16. The ultrasonic diagnostic apparatus according to claim 15, wherein

25 the control unit controls the driving signal generator in such a manner that an initial scanning is performed after a lapse of time in which the contrast

agent is fully filled in a target part of the subject,
and

based on a result of the initial scanning, the
measurement processor standardizes a value of the
5 scanning performed after the initial scanning to plot
the graph.